

**CONTINUOUS-OPERATION HIGH VOLUME FLOW RATE AEROSOL,  
AIRBORNE DUST AND IODINE SAMPLER, WITH THREE-STAGE FILTER, FOR  
ENVIRONMENT MONITORING OF NUCLEAR POWER STATIONS**

# MODEL KS-301-APT

## CONTAINER-MOUNTED VERSION



### FEATURES

- ✘ Three-stage – aerosol, PACI, TADE – filter system.
- ✘ High-accuracy, long-life-time Venturi volume flow rate meter.
- ✘ The sampler does not contain moving parts, except for the drive motor.
- ✘ Replaceable filter housing, with heated intake pipe.
- ✘ The aspirated air quantity  $q = 25-80$  [m<sup>3</sup>/h].
- ✘ Microprocessor control, full-scale LCD display, monitoring connectable to a system.
- ✘ Automatic or manual operation mode.
- ✘ Keyword starting, data protection, automatic restart in case of power failures.
- ✘ All measured and set data are stored in the measuring unit and the data can be processed by means of a PC.
- ✘ Volume flow rate meter calibrated with use of OMH- (National Office of Measures) verified devices.
- ✘ Lower than 56 [dBA] noise level.

## 1. Designation

The type **KS-301-APT** high volume flow rate sampling instrument is suitable for continuous and long-term sampling of airborne dust, solid particles, aerosols and iodine. The three-layer filter – aerosol, PACI and TEDA - installed in the sampler facilitates practically total filtering of airborne aerosols, iodine and solid particles from approximately 1000 [m<sup>3</sup>] air, daily. This high air quantity provides sufficiently enriched samples for high-accuracy analysis and activity concentration monitoring of the pollutants. By the intake structure and the volume flow rate meter a compact unit is constituted. For improvement of the measuring accuracy, a thermometer, detection probe and heated intake suction pipe are built-in. The entire sampling cycle can be displayed in scrolled manner on the LCD display and downloaded into a notebook, if required. The control electronics stores all measurement data, connectable to a monitoring network, and it is prepared for remote on-off switching. The hydrodynamic machine built into the sampler is a lateral-channel type, energy-saving pump of long lifetime, low noise emission and, low speed. The measuring method conform is in conformity with the EN ISO standard recommendation.

## 2. Technical description

The durable operation, type **KS-301-APT** high volume flow rate aerosol and iodine sampler shown in **Figure 1**. consists of the following main sub-units:

- Intake structure integrated with the volume flow rate meter.
- Sampling pipe with container bridging, connections and pipe supporting console.
- Three-layer filter support housing, with heated intake suction pipe.
- Lateral-channel pump integrated with motor, on base frame.
- Exhaust conduit furnished with vibration damper and wall-bridging structure.
- Measuring and control unit with connection cables and sensors.

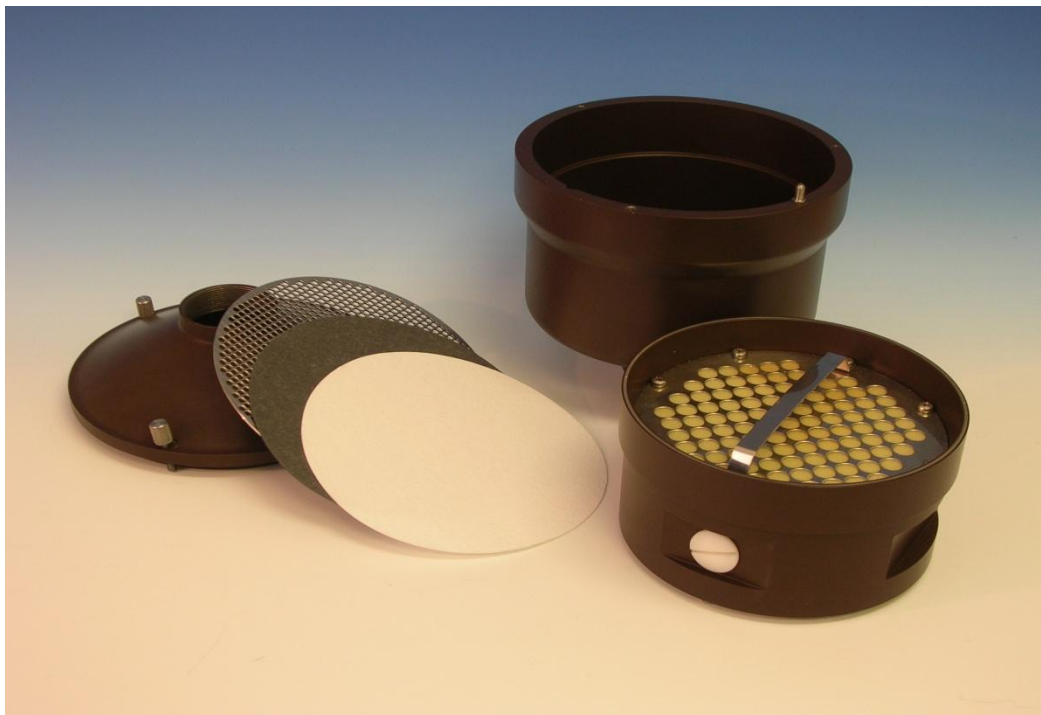
The airborne solid particles from the external air space, flowing through a sample intake structure designed according to the EPA recommendations and provided with guiding poles reducing the influence of the wind force and wind direction changes, passing a short straight pipe section, Venturi volume flow rate meter and heated piping are seized by an aerosol filter of 196 [mm] diameter accommodated in the filter housing, whilst iodine is trapped by the PACI filter moreover a filter containing granulated active carbon layer. The high-purity air is then passed through an extension pipe, lateral-channel pump and exhaust pipe, to the outer air space. The volume flow rate meter and evaluation unit – **Figure 2**. – processing the pressure signal of the Venturi meter, measures the quantity of the air flow rate [m<sup>3</sup>/h], and the total volume suctioned through during the sampling period in [m<sup>3</sup>], moreover the duration of the sampling. In case of power supply failures the measuring unit stores the measurement data. In **Figure 3**. the active carbon holder box used for seizing the radioactive fine particles is shown, in ready for charging state.



**Figure 1.**



**Figure 2.**



**Figure 3.**

### 3. Technical data

✚	<b>Maximum volume flow rate:</b>	<b><math>q_{\max} = 50 \text{ [m}^3/\text{h]}</math></b>
✚	<b>Minimum volume flow rate with iodine filters:</b>	<b><math>q_{\min} = 25 \text{ [m}^3/\text{h]}</math></b>
✚	<b>Diameter and material of the solid particles filter:</b>	<b><math>\varnothing 196 \text{ [mm]}</math> MN 85/90 fibreglass</b>
✚	<b>Diameter and material of iodine filter I:</b>	<b><math>\varnothing 196 \text{ [mm]}</math> PACI</b>
✚	<b>A Diameter and material of iodine filter II:</b>	<b><math>\varnothing 155 \text{ [mm]}</math> 207B TEDA</b>
✚	<b>Accuracy of volume flow rate</b>	<b><math>\pm 2 \text{ [%]}</math></b>
✚	<b>Data of the lateral-channel pump:</b>	<b>1,1 [KW], 230/400 [V], 50 [Hz]</b>
✚	<b>Heating:</b>	<b>280 [W]</b>
✚	<b>Floor area:</b>	<b>approx. 600*600 [mm]</b>